



National Aeronautics and  
Space Administration

**John C. Stennis Space Center**  
Stennis Space Center, MS 39529-6000

**SPR 8715.1 Rev. A**

**July 2006**

## **John C. Stennis Space Center Safety and Health Procedural Requirements**

Stennis Procedural Requirements	SPR 8715.1	A
	<i>Number:</i>	<i>Rev.</i>
	Effective Date: July 25, 2006	
	Expiration Date: July 25, 2011	
Page 2 of 41		
Responsible Office: QA00/Office of Safety and Mission Assurance		
<b>SUBJECT: Safety and Health Procedural Requirements</b>		

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Stennis Procedural Requirements	SPR 8715.1	A
	<i>Number:</i>	<i>Rev.</i>
	Effective Date: July 25, 2006	
	Expiration Date: July 25, 2011	
Page 3 of 41		
Responsible Office: QA00/Office of Safety and Mission Assurance		
<b>SUBJECT: Safety and Health Procedural Requirements</b>		

## Table of Contents

PREFACE .....	6
P.1 PURPOSE .....	6
P.2 APPLICABILITY .....	6
P.3 AUTHORITY .....	6
P.4 REFERENCES .....	6
P.5 MEASUREMENTS .....	9
P.6 CANCELLATION .....	9
CHAPTER 1. INTRODUCTION .....	10
1.1 General Requirement .....	10
1.2 Scope .....	10
1.3 Basic Roles and Responsibilities .....	11
1.4 Variances from Requirements .....	12
CHAPTER 2. SAFETY PROGRAM ADMINISTRATIVE REQUIREMENTS .....	13
2.1 Safety Meetings and Promotions .....	13
2.1.1 Applicability .....	13
2.1.2 SSC Safety & Health Management .....	13
2.1.3 STARS Meetings .....	13
2.1.4 NASA Safety Awareness Day .....	13
2.1.5 Employee Workplace Safety Meetings .....	14
2.1.6 Construction Contractor Toolbox Meetings .....	14
2.2 Safety & Health Inspections and Reporting .....	14
2.3 Incident Reporting .....	15
2.4 Safety & Health Training, Education, Certification .....	15
2.5 SSC OSHA Standard Training/Certification Requirements .....	16
2.6 Danger Tags .....	16
2.7 Maximum Worktime Policy .....	16
2.8 SSC Aviation Safety Program .....	16
2.9 SAFETY CRITICAL Procedures .....	16
2.10 System Safety and Risk Management .....	18
CHAPTER 3. INDUSTRIAL SAFETY .....	19
3.1 Lightning Protection .....	19
3.2 Personal Protective Equipment (PPE) .....	19
3.3 Fall Protection .....	19
3.4 Buddy System .....	20
3.5 Safe Use of Powered/Non-powered Handheld Tools .....	20
3.6 Machine/Machinery Guarding .....	20
3.7 Control of Hazardous Energy (Lockout/Tagout) .....	20
3.8 Recreational Safety at SSC .....	20

Stennis Procedural Requirements	SPR 8715.1	A
	<i>Number:</i>	<i>Rev.</i>
	Effective Date: July 25, 2006	
	Expiration Date: July 25, 2011	
Page 4 of 41		
Responsible Office: QA00/Office of Safety and Mission Assurance		
<b>SUBJECT: Safety and Health Procedural Requirements</b>		

3.9	Welding/Cutting Operations .....	20
3.10	Safely Storing, Transporting, and Using Compressed Gases in Portable Cylinders .....	21
3.11	Electrostatic Discharge Control .....	21
3.12	Electrical Safety .....	21
3.13	Scaffold Safety .....	22
CHAPTER 4.	ENVIRONMENTAL HEALTH PROGRAM .....	23
4.1	Stennis Space Center Environmental Health Program .....	23
4.2	Respiratory Protection Program .....	23
4.3	Chemical Hygiene Policy for Laboratory Facilities at SSC .....	23
4.4	Ionizing Radiation Protection .....	24
4.5	Non-Ionizing Radiation .....	24
4.6	Safety and Health Requirements for Hazardous Noise Exposures .....	24
4.7	Safety and Health Requirements for Asbestos Management and Awareness .....	25
4.8	Chemicals/Hazardous Materials Safety .....	25
4.9	Bloodborne Pathogen Health Program .....	25
4.10	Automated External Defibrillator (AED) Program .....	25
4.11	Ergonomics Program .....	26
4.12	Smoke-Free Workplace .....	26
CHAPTER 5.	HAZARDS SAFETY AND HEALTH .....	27
5.1	Stennis Space Center Hazards Safety and Health Operating Procedures .....	27
5.2	Confined Space Entry .....	27
5.3	Hydrogen (H <sub>2</sub> ) Entry .....	27
5.4	Oxygen and Combustible Gas Meter Operations .....	27
5.5	Safe Handling of Triethylaluminum (TEAL) and Triethylborane (TEB) .....	27
5.6	Liquid/Gaseous Oxygen Systems .....	28
5.7	Gaseous and Liquid Hydrogen .....	28
5.8	Cryogenics .....	28
5.9	Pressure Systems .....	28
5.10	Explosives Safety .....	29
5.11	Process Safety Management (PSM) .....	29
5.12	Handling of Hydrocarbon Based Propellants .....	29
5.13	Handling of Hydrogen Peroxide Propellants .....	29
5.14	Critical Lifting Operations .....	29
CHAPTER 6.	FIRE SAFETY AND HEALTH .....	31
6.1	Hot Work Permits .....	31
6.2	Selection, Use, and Inspections of Fire Extinguishers .....	31
6.3	Emergency Response/Employee Evacuation of Personnel in the Event of Fire .....	31
6.4	Fire Symbols .....	32
6.5	Safety Requirements for Using/Storing/Dispensing Gasoline .....	32
6.6	Natural Gas Systems .....	33

Stennis Procedural Requirements	SPR 8715.1	A
	<i>Number:</i>	<i>Rev.</i>
	Effective Date: July 25, 2006	
	Expiration Date: July 25, 2011	
Page 5 of 41		
Responsible Office: QA00/Office of Safety and Mission Assurance		
<b>SUBJECT: Safety and Health Procedural Requirements</b>		

CHAPTER 7. CONSTRUCTION SAFETY AND HEALTH.....	34
7.1 Stennis Space Center Construction Safety and Health Operating Procedures .....	34
7.2 Excavations and Excavation Safety .....	34
7.3 Pile Driving.....	34
7.4 Concrete and Masonry Construction .....	34
7.5 Diving/Underwater Work .....	34
7.6 Steel Erection .....	35
7.7 Safety of Motor Vehicles and Mechanized Equipment Used on SSC Construction Sites.....	35
7.8 Material Handling Equipment Requirement.....	35
7.9 Site Clearing.....	35
7.10 Rollover Protective Structures (ROPs) .....	35
7.11 Safety Requirements Related to Roofing Jobs at SSC.....	35
APPENDIX A – ACRONYMS AND ABBREVIATIONS .....	37
APPENDIX B – DEFINITIONS .....	39

Stennis Procedural Requirements	SPR 8715.1	A
	<i>Number:</i>	<i>Rev.</i>
	Effective Date: July 25, 2006	
	Expiration Date: July 25, 2011	
Page 6 of 41		
Responsible Office: QA00/Office of Safety and Mission Assurance		
<b>SUBJECT: Safety and Health Procedural Requirements</b>		

## PREFACE

### P.1 PURPOSE

- a. This NASA Stennis Space Center (SSC) Procedural Requirement (SPR) directive sets forth the health and safety requirements for all NASA operations and work at Stennis Space Center.
- b. This document is intended to provide general requirements for broad category of work activity at SSC. For specific information regarding safety and health procedures, refer to the SSP-8715-0001, *SSC Safety and Health Handbook*.

### P.2 APPLICABILITY

- a. This SPR is specifically applicable to all NASA/SSC personnel and to NASA Contractor personnel and SSC resident agencies to the extent specified by their respective contractual documents. Applicability is further defined within sections of this document.
- b. Mandatory requirements in this SPR are identified by the word *shall*. The use of the words *is* and *are* provide imperatives of fact. Use of the word *may* indicates permissiveness, and the use of the word *should* indicates a practice that is expected to be followed unless inappropriate for a particular circumstance. Material not identified by the use of the word *shall* is advisory or informative in nature only (e.g., notes, introductory or explanatory text, etc.).

### P.3 AUTHORITY

- a. 29 CFR Part 1960, *Basic Program Elements for Federal Employee Occupational Safety and Health Programs and Related Matters*.
- b. NPD 8700.1, *NASA Policy for Safety and Mission Success*.
- c. NPD 8710.2, *NASA Safety and Health Program Policy*.

### P.4 REFERENCES

The following references are applicable to the requirements defined in this directive. All references are assumed to be the latest version unless otherwise specified.

- a. 29 CFR Part 1910, *Occupational Safety and Health Standards*.
- b. 29 CFR 1910.119, *Process Safety Management of Highly Hazardous Chemicals*.
- c. 29 CFR 1910.134(c), *Respiratory Protection Standard*.

Stennis Procedural Requirements	SPR 8715.1	A
	<i>Number:</i>	<i>Rev.</i>
	Effective Date: July 25, 2006	
	Expiration Date: July 25, 2011	
Responsible Office: QA00/Office of Safety and Mission Assurance		
<b>SUBJECT: Safety and Health Procedural Requirements</b>		

- d. 29 CFR 1910.145, *Specifications for Accident Prevention Signs and Tags.*
- e. 29 CFR 1910.146, *Permit-required Confined Spaces.*
- f. 29 CFR 1910.1200, *Hazard Communication Standard.*
- g. 29 CFR 1910.1450, *Occupational Exposure to Hazardous Chemicals in Laboratories.*
- h. 29 CFR Part 1926, *Safety and Health Regulations for Construction.*
- i. 29 CFR 1918, *Safety and Health Regulations for Longshoring.*
- j. 29 CFR 1926.605, *Marine Operations and Equipment.*
- k. ANSI/AIAA G-095-2004, *Guide to Safety of Hydrogen and Hydrogen Systems.*
- l. ANSI S-080-1998, *Space Systems – Metallic Pressure Vessels, Pressurized Structures, and Pressure Components.*
- m. ASTM Manual 36, *Manual for Safe Use of Oxygen and Oxygen Systems: Guidelines for Oxygen System Design, Materials Selection, Operation, Storage and Transportation.*
- n. MIL-STD-882C, *System Safety Program Requirements.*
- o. NASA-STD-8715.12, *Explosives Safety.*
- p. NASA-STD-8719.7, *Facility System Safety Guidebook.*
- q. NASA-STD-8719.9, *NASA Safety Standard for Lifting Devices and Equipment.*
- r. NASA-STD-8719.10, *NASA Safety Standard for Underwater Facilities and Non-Open Water Operations.*
- s. NASA-STD-8719.11, *NASA Safety Standard for Fire Protection.*
- t. NSS 1740.12, *Safety Standard for Explosives, Propellants, and Pyrotechnics.*
- u. NFPA 10, *Portable Fire Extinguishers.*
- v. NPD 8710.1, *NASA Emergency Preparedness Program.*
- w. NPD 8710.5, *NASA Policy for Pressure Vessels and Pressurized Systems.*

Stennis Procedural Requirements	SPR 8715.1	A
	<i>Number:</i>	<i>Rev.</i>
	Effective Date:	July 25, 2006
	Expiration Date:	July 25, 2011
Page 8 of 41		
Responsible Office: QA00/Office of Safety and Mission Assurance		
<b>SUBJECT: Safety and Health Procedural Requirements</b>		

- x. NPR 3600.1, *NASA Procedural Requirement Attendance and Leave.*
- y. NPR 7120.5, *NASA Program and Project Management Processes and Requirements.*
- z. NPR 8000.4, *Risk Management Procedures and Guidelines.*
- aa. NPR 8621.1, *NASA Procedural Requirements for Mishap Reporting, Investigation and Recordkeeping.*
- bb. NPR 8715.1, *NASA Safety and Health Handbook Occupational Safety and Health Programs.*
- cc. NPR 8715.3, *NASA Safety Manual.*
- dd. NPR 8715.4, *Inservice Inspection of Ground-based Pressure Vessels and Systems.*
- ee. SCWI-8700-0001, *Hazard Analysis Preparation.*
- ff. SPR 1150.1, *John C. Stennis Space Center Establishment of Charters - Boards/Councils/Committees.*
- gg. SPR 1600.1, *SSC Security Requirements Handbook.*
- hh. SPR 7120.1, *John C. Stennis Space Center Risk Management.*
- ii. SPR 8715.2, *John C. Stennis Space Center Operational Readiness Program Procedural Requirements.*
- jj. SPR 8715.3, *SSC Hot Work Permit Program.*
- kk. SSP-8715-0001, *John C. Stennis Space Center Safety and Health Handbook.*
- ll. SSC-STANDARD-99-015, *SSC Sitewide Digging Permit Standard*
- mm. SSTD-8070-0007-CONFIG, *SSC Variance and Alternate Standard Requests.*
- nn. SWI 8834-0001, *SSC Lifting Devices and Equipment Management Plan.*
- oo. Form SSC-405 *Safety Inspection Report.*



Stennis Procedural Requirements	SPR 8715.1	A
	<i>Number:</i>	<i>Rev.</i>
	Effective Date:	July 25, 2006
	Expiration Date:	July 25, 2011
Page 9 of 41		
Responsible Office: QA00/Office of Safety and Mission Assurance		
<b>SUBJECT: Safety and Health Procedural Requirements</b>		

## P.5 MEASUREMENTS

Compliance with requirements cited in this SPR will be measured through audits, surveys, and inspections.

## P.6 CANCELLATION

SPG 8715.1, *SSC Safety and Health Procedures and Guidelines*

### *Signature on File*

Richard J. Gilbrech, Ph.D.  
Director

### DISTRIBUTION

Approved for public release via NODIS; distribution is unlimited.

Stennis Procedural Requirements	SPR 8715.1	A
	<i>Number:</i>	<i>Rev.</i>
	Effective Date: July 25, 2006	
	Expiration Date: July 25, 2011	
Responsible Office: QA00/Office of Safety and Mission Assurance		
<b>SUBJECT: Safety and Health Procedural Requirements</b>		
		Page 10 of 41

## CHAPTER 1. INTRODUCTION

### 1.1 General Requirement

This SPR has been prepared to be consistent and comply with federal statutory codes and regulations, executive orders, and NASA directives and standards. The requirements listed herein supplement those requirements. Processes specific to the requirements of SSC for the safety of its particular operations and the health of personnel are depicted in the SSP-8715-0001, *SSC Safety and Health Handbook*.

### 1.2 Scope

This document covers administrative safety and health program requirements as well as industrial safety and health operating procedures and processes. This chapter provides information on the document structure, general use and terminology, and the basic roles and responsibilities for implementing and conducting the requirements of this document and the SSC Safety and Health program in general.

Chapters 2 through 7, respectively, provide the specific requirements for:

- General Safety Program Administration
- Basic Industrial Safety Operations
- Environmental Health Program Administration
- Hazards Safety and Health Operations
- Fire Safety and Health Operations
- Construction Safety and Health Operations

Each chapter contains the specific individual requirements for the given subject area. The SSP-8715-0001, *SSC Safety and Health Handbook* contains detailed information such as figures, illustrations, tables, charts, etc. that pertain to specific health and safety procedures. Further statements of applicability are provided for each subject area.

A complete list of acronyms and definitions are provided in Appendices A and B, respectively.

Stennis Procedural Requirements	SPR 8715.1	A
	<i>Number:</i>	<i>Rev.</i>
	Effective Date:	July 25, 2006
	Expiration Date:	July 25, 2011
Page 11 of 41		
Responsible Office: QA00/Office of Safety and Mission Assurance		
<b>SUBJECT: Safety and Health Procedural Requirements</b>		

### 1.3 Basic Roles and Responsibilities

Basic roles and responsibilities for implementing and conducting the SSC safety and health program are defined below.

a. Center Director: The Center Director is responsible for:

- (1) Ensuring NASA's occupational and industrial safety and health programs are effectively implemented at the center.
- (2) Maintaining the safe and successful operation of facilities and plants.
- (3) Ensuring that adequate funding is available for conducting these activities.
- (4) Providing both time and funding for the establishment and operation of an SSC Safety & Health Council, chaired by NASA and composed of management representatives of NASA, the NASA Contractors, and resident organizations.

b. NASA/SSC Office of Safety and Mission Assurance:

The NASA/SSC Office of Safety and Mission Assurance is responsible for managing and directing the SSC Safety and Health Program. The Office of Safety and Mission Assurance is the SSC Office of Primary Responsibility (OPR) for this document and its requirements with the exception of Section 4.0. The NASA/SSC Center Operations Directorate is the OPR for Chapter 4.

c. Managers and Supervisors: Managers and Supervisors are responsible for:

- (1) Ensuring that their employees follow the requirements specified herein and that they follow SSC health and safety procedures and guidelines set forth in the SSP-8715-0001, *SSC Safety and Health Handbook*.
- (2) Ensuring a safe and healthful workplace extending to any place their employees are engaged in work activities related to their jobs.
- (3) Ensuring identified hazards are eliminated from the workplace or are controlled through rigorous proactive inspection and abatement processes.
- (4) Assuring a safe and healthful workplace is maintained through active coordination with, and support to, designated safety and health officials.
- (5) Ensuring employees are informed of the NASA/SSC safety and health program and of the protections afforded through the program.
- (6) Instructing employees to report hazardous conditions to their immediate supervisor, organizational safety official, or the NASA/SSC Office of Safety and Mission Assurance.
- (7) Ensuring employees are provided safety and health training as applicable to their work environment.
- (8) Cooperating with and assisting safety and health personnel in the conduct of their duties.
- (9) Ensuring timely reporting of mishaps and close calls, and timely follow up of any corrective actions.

Stennis Procedural Requirements	SPR 8715.1	A
	<i>Number:</i>	<i>Rev.</i>
	Effective Date: July 25, 2006	
	Expiration Date: July 25, 2011	
Responsible Office: QA00/Office of Safety and Mission Assurance		
<b>SUBJECT: Safety and Health Procedural Requirements</b>		
		Page 12 of 41

(10) Enforcing all Safety and Health Operating Procedures within their assigned areas of responsibility, and assuring that all physical activity restrictions governing their personnel are applied.

d. Employees: Employees are responsible for:

- (1) Following SSC health and safety procedures and guidelines set forth in the SSP-8715-0001, *SSC Safety and Health Handbook*.
- (2) Complying with safety and health standards, rules, regulations, and guidelines issued by NASA, SSC, Federal, State, and local authorities.
- (3) Following safety and health procedures in their work, and understanding and complying with the requirements contained in this SPR or other work instruction documents.
- (4) Ensuring that this or other work instructions they are using are the latest and correct version, and reporting errors and inconsistencies and necessary requirements for problem corrections or changes to ensure safe work practices and procedures.
- (5) Using established procedures to report and resolve actual or suspected safety or health hazards.
- (6) Promptly reporting injuries, mishaps, and close calls in accordance with established procedures.
- (7) Cooperating with safety and health personnel during inspections, surveys, and investigations.
- (8) Utilizing protective equipment when prescribed and/or required by safety or health standards, good work practices, or when directed by supervisors.

#### **1.4 Variances from Requirements**

Any variances from requirements specified herein shall be authorized in writing and approved by the responsible SSC operations manager and the Manager of the NASA/SSC Office of Safety and Mission Assurance (S&MA).

Stennis Procedural Requirements	SPR 8715.1	A
	<i>Number:</i>	<i>Rev.</i>
	Effective Date: July 25, 2006	
	Expiration Date: July 25, 2011	
Responsible Office: QA00/Office of Safety and Mission Assurance		
<b>SUBJECT: Safety and Health Procedural Requirements</b>		
		Page 13 of 41

## **CHAPTER 2. SAFETY PROGRAM ADMINISTRATIVE REQUIREMENTS**

NASA/SSC and its Contractors shall abide by the SSC Safety Program Administrative Requirements as defined below and in SSP-8715-0001, *SSC Safety and Health Handbook*.

### **2.1 Safety Meetings and Promotions**

SSC shall conduct the following safety meetings and promotions:

- a. Safety Management Review Meetings.
- b. STARS (“Striving to Achieve Real Safety”) Meetings. Note: STARS is SSC’s Employee Safety Council.
- c. Employee workplace safety meetings.
- d. Safety Awareness Day.
- e. Construction contractor “Toolbox” meetings.

For a list of responsibilities and additional information regarding meeting schedules and proposed agendas, refer to the SSP-8715-0001, *SSC Safety and Health Handbook*.

#### **2.1.1 Applicability**

These requirements are applicable to NASA/SSC and NASA Contractors to the extent specified by their contract.

#### **2.1.2 SSC Safety & Health Management**

SSC Safety & Health Management shall:

- a. Promulgate general safety and health practices at SSC.
- b. Promote safety awareness on the part of all agencies and activities at SSC.
- c. Provide a professional forum for the discussion of safety and health requirements and overall safety and health policy at SSC.
- d. Conduct meetings on a quarterly basis with a prepared agenda.

#### **2.1.3 STARS Meetings**

STARS meetings shall be conducted on a monthly basis.

#### **2.1.4 NASA Safety Awareness Day**

NASA Safety Awareness Day shall be conducted annually by NASA/SSC management to promote safety awareness among NASA and NASA Contractor employees.

Stennis Procedural Requirements	SPR 8715.1	A
	<i>Number:</i>	<i>Rev.</i>
	Effective Date: July 25, 2006	
	Expiration Date: July 25, 2011	
Responsible Office: QA00/Office of Safety and Mission Assurance		
<b>SUBJECT: Safety and Health Procedural Requirements</b>		
		Page 14 of 41

## 2.1.5 Employee Workplace Safety Meetings

Safety meetings shall be conducted between supervisors and their employees on a monthly basis at a minimum and more often as needed.

Note: For specific information regarding the conduct of safety meetings with respect to employee time, time frame, NASA monitoring, documentation and record maintenance, refer to SSP-8715-0001, *SSC Safety and Health Handbook*.

## 2.1.6 Construction Contractor Toolbox Meetings

NASA's off site construction contractors shall provide and conduct weekly safety meetings, with the goals being to instruct and promote safety on the construction site.

## 2.2 Safety & Health Inspections and Reporting

- a. NASA/SSC S&MA or their designee shall conduct safety and health inspections at a minimum annually within the confines of SSC, including construction sites at SSC.
- b. The cognizant safety engineer/specialist document hazards and/or non-compliant conditions observed.
- c. Reports of such inspections shall be submitted to NASA S&MA. A list of specific information to include in each report can be found in the SSP-8715-0001, *SSC Safety and Health Handbook*.
  - (1) Safety Inspection Report (SSC Form-405): A "Safety Inspection Report" shall be used for conducting safety inspections of buildings, facilities, and industrial operations at SSC. (See the SSC Electronic Forms Index.)
  - (2) Corrective Action Delinquency Report: For inspection reports containing unabated hazards with a status of +30 days, the Facility Manager or Area Manager shall prepare a Corrective Action Delinquency Report and forward it to NASA/SSC S&MA with copies to the manager or the custodian of the facility.
  - (3) Special Inspection Reports: Safety Engineers/Specialists conducting Special Inspections such as the inspection of Resident Agencies shall write their report (in entirety) on Interoffice Correspondence. The Safety Engineer/Specialist conducting the inspection shall distribute the report per his/her discretion.
- d. NASA/SSC S&MA or their designee shall send each inspection report to the supervisor and/or facility manager. The supervisor or facility manager will complete it and return it to the cognizant safety office.

Stennis Procedural Requirements	SPR 8715.1	A
	<i>Number:</i>	<i>Rev.</i>
	Effective Date: July 25, 2006	
	Expiration Date: July 25, 2011	
Responsible Office: QA00/Office of Safety and Mission Assurance		
<b>SUBJECT: Safety and Health Procedural Requirements</b>		
		Page 15 of 41

## 2.3 Incident Reporting

- a. Employees shall report all mishaps, including first-aid cases and close calls, to their supervisors.
- b. All mishaps, including all first-aid treatments, accidents, incidents or close calls, shall be reported on the NASA Mishap Report (Form 1627) or the Close Call Reporting System within 24 hours of occurrence.

Note: Close Calls may be entered either on Form 1627 or the SSC web-based "Quick Form" Close Call Reporting System.

- c. Reporting, recordkeeping and investigative criteria incidents shall be consistent with NPR 8621.1, *NASA Procedural Requirements for Mishap Reporting, Investigating and Recordkeeping*.

## 2.4 Safety & Health Training, Education, Certification

- a. All personnel performing work at SSC, or performing processes having a significant effect on product quality and/or involving hazardous and/or critical NASA operations, shall be properly certified in the area in which they work.
- b. Personnel shall acquire and maintain the appropriate qualifications including comprehension of the skill and/or operation, excellence of workmanship/skill, and physical ability.
- c. SSC personnel working in the occupational categories listed below shall have current Hazardous Operation Safety certification:
  - Firefighters.
  - Propellant or explosives users per NSS 1740.12.
  - Propellant or explosives handlers.
  - Rescue personnel.
  - Self-contained breathing apparatus (SCBA) users.
  - High-voltage electricians.
  - High-pressure liquid/vapor/gas system operators.
  - Welders.
  - Laser operators/maintenance personnel.
  - Crane operators.
  - Riggers for hoisting operations.
  - Heavy equipment operators.
  - Confined space entry personnel.

Stennis Procedural Requirements	SPR 8715.1	A
	<i>Number:</i>	<i>Rev.</i>
	Effective Date: July 25, 2006	
	Expiration Date: July 25, 2011	
Responsible Office: QA00/Office of Safety and Mission Assurance		
<b>SUBJECT: Safety and Health Procedural Requirements</b>		
		Page 16 of 41

- Lockout/tagout personnel.
- Hazardous materials handlers.
- Personnel (technicians, engineers) performing hazardous operations.
- Environmental personnel.

d. SSC safety officials or their designees may also require additional operation safety certifications over and above these basic requirements.

## **2.5 SSC OSHA Standard Training/Certification Requirements**

NASA and its Contractors, and resident agencies and their contractors shall comply with all applicable OSHA Standard training and certifications.

## **2.6 Danger Tags**

- SSC personnel shall incorporate Danger Tags as part of procedures for the control of imminent danger conditions.
- Danger tags shall be placed on tools and equipment that are unsafe for use. See SSP-8715-0001, *SSC Safety and Health Handbook*, for procedures regarding Danger Tags.

## **2.7 Maximum Worktime Policy**

NASA and NASA Contractors working at SSC shall abide by maximum allowable work time requirements per NPR 3600.1, *NASA Procedural Requirement Attendance and Leave*.

## **2.8 SSC Aviation Safety Program**

- The use of all aircraft at SSC in direct support of the SSC mission shall be conducted in accordance with requirements of the SSC Aviation Safety Program.
- This program shall identify the NASA requirements governing aviation safety as they apply to aircraft operations conducted by SSC. For more information on the Aviation Safety Program, refer to SSP-8715-0001, *SSC Safety and Health Handbook*.

## **2.9 SAFETY CRITICAL Procedures**

- SAFETY CRITICAL requirements shall apply to the preparation and control of operating procedures associated with work tasks of research and development projects, test activities, and industrial/maintenance processes conducted at SSC.
- All activities involving laboratory operations, high-pressure gas operations in excess of 150 psig; low-pressure high volume gas operations; voltages above 550 volts; storage and handling



Stennis Procedural Requirements	SPR 8715.1	A
	<i>Number:</i>	<i>Rev.</i>
	Effective Date: July 25, 2006	
	Expiration Date: July 25, 2011	
Responsible Office: QA00/Office of Safety and Mission Assurance		
<b>SUBJECT: Safety and Health Procedural Requirements</b>		

of liquid or solid propellants; storage and handling of explosives; use of “heavy lift” material handling equipment; extreme temperature environments; oxygen-deficient/enriched environments; confined space entries; lockout/tagout operations associated with pressure systems; electrical systems; or mechanical systems shall be deemed SAFETY CRITICAL.

c. SAFETY CRITICAL procedures shall apply to all SSC personnel involved in any operation, process or procedure involving materials, equipment or tasks which have a high potential to result in loss of life, serious injury to personnel, and/or damage to systems, equipment or facilities.

d. The responsible engineer or supervisor shall determine the need for a procedure to address SAFETY CRITICAL operations [e.g., Detailed Operating Procedures (DOPs); Test Preparation Sheets (TPSs)].

(1) Preparation of Procedures: The SSC organization performing the work shall write procedures (e.g., DOPs, TPSs) in a manner that provides maximum protection to personnel, precludes procedural error, and minimizes misinterpretation. Procedures shall include steps to:

- (a) Ensure the safety of personnel.
- (b) Specify actions to bring an emergency situation under control.
- (c) Return the system(s) to nearest possible safe condition.

(2) Cautionary Notes: Procedures shall use one of the following cautionary notes to precede specific steps in which a malfunction or error produces a reaction that causes system degradation, personnel injury, or death.

- (a) **WARNING:** Maintenance or operating procedures, techniques, restrictions, etc. that may result in severe personnel injury, loss of life, or major equipment damage if not followed exactly.
- (b) **CAUTION:** Maintenance or operating procedures, techniques, restrictions, etc. that may result in some damage to equipment or system, or minor injuries to personnel if not followed exactly.
- (c) **NOTE:** Maintenance or operating procedures, techniques, restrictions, etc. that require emphasis for safe operation.

(3) SAFETY CRITICAL Marking: The title page of hazardous procedures (e.g., DOPs, TPSs) shall be marked “SAFETY CRITICAL.”

Stennis Procedural Requirements	SPR 8715.1	A
	<i>Number:</i>	<i>Rev.</i>
	Effective Date:	July 25, 2006
	Expiration Date:	July 25, 2011
Responsible Office: QA00/Office of Safety and Mission Assurance		Page 18 of 41
<b>SUBJECT: Safety and Health Procedural Requirements</b>		

(4) Approvals: All SAFETY CRITICAL procedures shall require approval from:

- (a) The cognizant safety representative to certify that they have performed a review of the procedures.
- (b) The cognizant engineer.

e. Change Approval: Changes to procedures shall be approved from the cognizant safety office representative.

f. SSC Variances shall be processed in accordance with John C. Stennis Space Center SSTD-8070-0007-CONFIG, *SSC Variance and Alternate Standard Requests*.

## 2.10 System Safety and Risk Management

a. SSC shall perform system safety and risk assessments in accordance with SPR 7120.1, *John C. Stennis Space Center Risk Management*.

b. Control and Mitigation: When a risk to human life, equipment or the environment cannot be avoided, the organization's system safety representative shall ensure that adequate steps are taken to control or mitigate the risk.

c. System Safety and Risk Assessments: The appropriate S&MA organization shall be responsible for risk assessment.

d. System Safety and Risk Analysis: SSC personnel shall use Facility Risk Indicators (FRI) and Hazard Analysis to assess safety and risk.

e. Risk Management: Management shall make decisions regarding overall risk using risk assessment estimates of future losses and the effectiveness of additional controls.

f. Operational Readiness Assessment: SSC Safety personnel shall conduct an Operational Readiness Assessment (ORA) per SPR 8715.2, *John C. Stennis Space Center Operational Readiness Program Procedural Requirements*, in a facility prior to its activation.

Note: By considering the size and complexity of the project and the safety risks associated with the project, this assessment will help identify the system safety activities, (which should be accomplished early in the acquisition process), and how resources should be allocated.

g. Configuration Control: The applicable work instruction for Configuration Management (CM) shall be the governing document for CM.

Stennis Procedural Requirements	SPR 8715.1	A
	<i>Number:</i>	<i>Rev.</i>
	Effective Date:	July 25, 2006
	Expiration Date:	July 25, 2011
Page 19 of 41		
Responsible Office: QA00/Office of Safety and Mission Assurance		
<b>SUBJECT: Safety and Health Procedural Requirements</b>		

## CHAPTER 3. INDUSTRIAL SAFETY

SSC Organizations shall abide by the SSC Industrial Safety Program as defined below and in SSP-8715-0001, *SSC Safety and Health Handbook*.

### 3.1 Lightning Protection

- a. Lightning protection systems shall be installed on all structures where hazards exist due to the possibility of a lightning strike.
- b. Proper lightning protection systems and materials shall be implemented during the construction phase of all structures per NFPA and LPI requirements.
- c. Lightning Advisories and Warnings shall be issued in accordance with SCWI-8715-000, Lightning Warning System.
- d. All personnel on SSC shall comply with lightning advisories and warnings.

### 3.2 Personal Protective Equipment (PPE)

- a. PPE shall be properly selected to meet the requirements for the task being performed.
- b. The respective organization shall review and approve specifications for PPE to assure the adequacy of abatement is maintained.
- c. Supervisors shall assure that proper assessments of job hazards are made and appropriate PPE used for each job performed.

### 3.3 Fall Protection

Fall protection processes and equipment to protect and prevent injuries/death due to the hazards of falling from heights and falling off, onto, or through working levels, shall be provided for all potentially hazardous operations.

This requirement includes providing protection to personnel from falling objects, as well as protection to workers whenever they are placed into situations that leave them outside of secured work areas protected by finished or temporary guardrails.

Stennis Procedural Requirements	SPR 8715.1	A
	<i>Number:</i>	<i>Rev.</i>
	Effective Date:	July 25, 2006
	Expiration Date:	July 25, 2011
Page 20 of 41		
Responsible Office: QA00/Office of Safety and Mission Assurance		
<b>SUBJECT: Safety and Health Procedural Requirements</b>		

### 3.4 Buddy System

Personnel shall use the "buddy system" while performing hazardous operations are conducted.

During hazardous operations, personnel have responsibility to protect one another. The "buddies" are expected to monitor each other, to stay close enough together to be able to help in an emergency, to behave safely, and to follow prescribed safety procedures as applicable.

### 3.5 Safe Use of Powered/Non-powered Handheld Tools

- a. SSC personnel shall follow of basic safety precautions for the use of hand and portable powered tools.
- b. Workers shall be provided training in recognizing the hazards associated with the most common types of tools and the safety precautions necessary to prevent those hazards. This typically covers Spark Resistant Tools and Powder-Actuated Tools.

### 3.6 Machine/Machinery Guarding

Personnel shall not remove or interfere with machine guards and other safety devices for any reason other than during necessary maintenance.

### 3.7 Control of Hazardous Energy (Lockout/Tagout)

Personnel shall follow instructions defining Lockout/Tagout requirements for use at all worksites at SSC, including tasks that provide potential exposure to hazardous energy or materials through an unexpected energizing or release (such as electrical, chemical, mechanical, or hydraulic equipment and systems).

### 3.8 Recreational Safety at SSC

The SSC Recreational Association (SSCRA) shall be responsible for the development and implementation of rules governing the use of recreational areas. For specific information regarding recreational areas, contact the SSCRA.

### 3.9 Welding/Cutting Operations

All welding/cutting operations shall follow the requirements of SPR 8715.3, *SSC Hot Work Permit Program*.

Stennis Procedural Requirements	SPR 8715.1	A
	<i>Number:</i>	<i>Rev.</i>
	Effective Date: July 25, 2006	
	Expiration Date: July 25, 2011	
Page 21 of 41		
Responsible Office: QA00/Office of Safety and Mission Assurance		
<b>SUBJECT: Safety and Health Procedural Requirements</b>		

### **3.10 Safely Storing, Transporting, and Using Compressed Gases in Portable Cylinders**

- a. Tube bank trailers shall adhere to the national and SSC standard requirements for compressed gas cylinders.
- b. Tube bank trailers and gas cylinders shall be durably marked to indicate contents and operating pressure.

### **3.11 Electrostatic Discharge Control**

- a. In areas where applicable, NASA or its Contractors shall have electrostatic discharge (ESD) procedures that provide for the general safety requirements for the development of appropriate control measures to provide protection against personal injury, property damage, and/or mission degradation due to the electrostatic discharge of energy and subsequent initiation or solid propellants, igniter components, explosives or flammable/combustible materials.
- b. A safety procedure shall establish mandatory ESD control requirements for NASA and NASA Contractors at SSC who engage in the receiving, distributing, assembling, disassembling, handling, testing, repairing, or storing of explosive ordinance, flammable/combustible materials or propellants.

### **3.12 Electrical Safety**

- a. Each organization shall have electrical safety procedures in accordance with National Fire Protection Association (NFPA) requirements.
- b. Each organization shall develop operating procedures concerning special electrical hazards in their work areas.
- c. Equipment adjustments in high voltage or any other highly hazardous locations shall be identified as SAFETY CRITICAL activities.
- d. All convenience appliances for personal use in the workplace, i.e., coffee makers, hot plates, water heaters, refrigerators, microwave ovens, and toasters, will be Underwriters Laboratories (UL) listed and shall exhibit the label of a national research testing laboratory.
- e. SSC Form SSC-222, "Permit for Use of Small Appliances" shall be submitted by personnel and approved by the SSC Fire Department for the use of small electric convenience appliances such as coffee makers, toasters, and microwave ovens.
- f. Permit for Use of Small Appliances shall be displayed within the office area for each electrical appliance in use.

Stennis Procedural Requirements	SPR 8715.1	A
	<i>Number</i>	<i>Rev.</i>
	Effective Date: July 25, 2006	
	Expiration Date: July 25, 2011	
		Page 22 of 41
Responsible Office: QA00/Office of Safety and Mission Assurance		
<b>SUBJECT: Safety and Health Procedural Requirements</b>		

### 3.13 Scaffold Safety

- a. All scaffolds shall be inspected by a qualified field engineer before use.
- b. The inspection shall include the use of a scaffolding inspection checklist. Refer to SSP-8715-0001, *SSC Safety and Health Handbook*, for a copy of the inspection checklist.

Stennis Procedural Requirements	SPR 8715.1	A
	<i>Number:</i>	<i>Rev.</i>
	Effective Date: July 25, 2006	
	Expiration Date: July 25, 2011	
Page 23 of 41		
Responsible Office: QA00/Office of Safety and Mission Assurance		
<b>SUBJECT: Safety and Health Procedural Requirements</b>		

## CHAPTER 4. ENVIRONMENTAL HEALTH PROGRAM

SSC Organizations shall abide by the Environmental Health Program (inclusive of industrial health) as defined below and in SSP-8715-0001, *SSC Safety and Health Handbook*.

### 4.1 Stennis Space Center Environmental Health Program

- a. SSC shall have an Environmental Health Program that encompasses the anticipation, identification, evaluation, and control of chemical, physical, and biological hazards. This Program shall include hazardous materials management, including annual inventory submissions, hazardous waste minimization and disposal, and spill response.
- b. Contractors shall develop and abide by a hazard communication plan in accordance with OSHA's Hazard Communication Standard 29 CFR 1910.1200.

### 4.2 Respiratory Protection Program

- a. Engineering controls will be used to control employee exposure to hazardous materials whenever feasible. Respiratory protection will only be used as a control of last resort. Personnel who perform work tasks that require respiratory protection shall be trained and certified in respiratory protection in accordance with OSHA standards.
- b. Supervisors/managers and/or designated Respiratory Protection Program Administrators (RPPAs) per OSHA 29 CFR 1910.134(c), *Respiratory Protection Standard*, shall assure that personnel are trained and certified to use Respiratory Protection Equipment.
- c. Supervisors shall manage proper use of respirators in the workplace.

### 4.3 Chemical Hygiene Policy for Laboratory Facilities at SSC

A laboratory is a facility where the use of hazardous chemicals occurs. It is a workplace where relatively small quantities of hazardous chemicals are used on a non-production basis.

- a. Contract firms shall designate Laboratory Operations as such and report their location(s) and scope of operation(s) to the NASA/SSC Safety Office.
- b. All organizations with "laboratory" activities shall designate a Chemical Hygiene Officer (CHO) and develop and abide by a written Chemical Hygiene Plan that is in compliance with 29 CFR 1910.1450, *Occupational Exposure to Hazardous Chemicals in Laboratories*.
- c. The Chemical Hygiene Plan shall be made available to all employees.

Stennis Procedural Requirements	SPR 8715.1	A
	<i>Number:</i>	<i>Rev.</i>
	Effective Date: July 25, 2006	
	Expiration Date: July 25, 2011	
Page 24 of 41		
Responsible Office: QA00/Office of Safety and Mission Assurance		
<b>SUBJECT: Safety and Health Procedural Requirements</b>		

#### **4.4 Ionizing Radiation Protection**

- a. NASA/SSC and its Contractors shall have and implement an Ionizing Radiation Safety Program that complies with applicable federal and/or state regulations governing ionizing radiation.
- b. Written operating procedures to assure the safe use of said materials shall be developed.
- c. NASA and NASA Contractors located at SSC that conduct operations/maintenance activities involving the use or storage of radioactive sources/ionizing generating equipment shall label such equipment "SAFETY CRITICAL."
- d. Each organization handling/storing radioactive sources or utilizing ionizing radiation generating equipment at SSC shall appoint a qualified Radiation Safety Officer (RSO) to assure a viable safety program for using and storing radioactive materials/equipment.

#### **4.5 Non-Ionizing Radiation**

- a. Each NASASSC and Contractor organization that uses lasers or laser systems shall have a procedure for protecting persons and property during Non-Ionizing Radiation Source use at SSC that complies with applicable federal and/or state regulations.
- b. A Laser Safety Officer (LSO) shall be appointed.
- c. The LSO shall monitor and enforce the necessary control of laser hazards and effect the knowledgeable evaluation and control of laser hazards.
- d. The LSO shall implement and maintain an adequate program for the control of laser hazards. Appropriate programs shall be implemented for all classes of lasers and laser systems.

#### **4.6 Safety and Health Requirements for Hazardous Noise Exposures**

- a. NASA and its Contractors located at SSC shall have procedures/process requirements for working in high noise level environments.
- b. Management shall monitor employees' noise exposure limits and implement a hearing conservation program.
- c. All employees with an eight hour time-weighted average noise exposure of 80 dBA or greater, in accordance with ANSI standards, shall be included in their employer's hearing conservation program.
- d. ANSI-approved sound level meters shall be used to test noise level exposure.



Stennis Procedural Requirements	SPR 8715.1	A
	<i>Number:</i>	<i>Rev.</i>
	Effective Date: July 25, 2006	
	Expiration Date: July 25, 2011	
Responsible Office: QA00/Office of Safety and Mission Assurance		
<b>SUBJECT: Safety and Health Procedural Requirements</b>		
		Page 25 of 41

#### **4.7 Safety and Health Requirements for Asbestos Management and Awareness**

- a. If at any time SSC personnel are required to work on a system or material that might potentially contain asbestos, they shall contact the FOSC Safety and Industrial Hygiene Office for an evaluation of the material prior to proceeding with the work.
- b. The FOSC Safety and Industrial Hygiene Office shall provide and maintain asbestos inventory information.
- c. Only those personnel with valid certification(s) shall work on or in proximity to friable asbestos-containing material (ACM), including accessing the plenum space above suspended ceilings where spray-applied asbestos insulation (SAAI) is present. The five buildings at SSC with SAAI are 1000, 1100, 1200 and parts of 2101 and 2201.
- d. Personnel shall contact the FOSC Safety and Industrial Hygiene Office for asbestos inventory information prior to conducting work in an SAAI area.

#### **4.8 Chemicals/Hazardous Materials Safety**

- a. Contractors shall have and abide by a Hazard Communications Program and/or a Process Safety Management Program.
- b. Chemical waste generated at SSC shall be disposed of in a safe and efficient manner. Consult the Environmental Staff for appropriate procedures.

#### **4.9 Bloodborne Pathogen Health Program**

- a. NASA/SSC and contractors will abide by a Bloodborne Pathogen Program meeting OSHA requirements.
- b. The FOSC Occupational Health Service shall establish and maintain a SSC Bloodborne Pathogens Exposure Control Plan.
- c. NASA/SSC and contractor employees shall comply with the requirements of the SSC Bloodborne Pathogens exposure Control Plan as administered by the FOSC Occupational Health Service.

#### **4.10 Automated External Defibrillator (AED) Program**

NASA/SSC and its contractors who have AEDs located in their areas shall appoint and train personnel to administer AEDs and to define a Cardiac Arrest/AED use protocol in a Procedure Manual or other document as appropriate.

Stennis Procedural Requirements	SPR 8715.1	A
	<i>Number:</i>	<i>Rev.</i>
	Effective Date:	July 25, 2006
	Expiration Date:	July 25, 2011
Page 26 of 41		
Responsible Office: QA00/Office of Safety and Mission Assurance		
<b>SUBJECT: Safety and Health Procedural Requirements</b>		

#### 4.11 Ergonomics Program

- a. SSC shall appoint a NASA/SSC Ergonomics Program Coordinator who is responsible for promoting healthy ergonomics on site.
- b. Contractors shall appoint an Ergonomics Program Manager to manage their firm's Ergonomics Program.
- b. There shall be an Ergonomics Steering Committee that meets quarterly and is comprised of members of the following groups: SSC Ergonomics Program Coordinator (Committee Chair); each Contractor's designated Ergonomics Program Manager; a representative from the SSC Medical Clinic; and a representative from the FOSSC Safety and Industrial Hygiene Office.
- c. SSC Contractor organizations shall work in conjunction with the SSC Ergonomics Coordinator in providing ergonomics training and assessments on site.

#### 4.12 Smoke-Free Workplace

- a. SSC shall abide by federal requirements regarding smoking in the workplace.
- b. Smoking is prohibited inside all interior space owned, rented, or leased by NASA/SSC, in any outdoor areas within 50 ft. of air intake ducts, and in SSC leased GSA vehicles. Smoking shall be in designated areas and permitted in general outdoor areas unless it is defined as a no-smoking area (e.g. LOX storage tanks, fuel storage and transfer areas, etc.).
- c. The facility manager shall designate entries as smoking or non-smoking.
- d. To the extent smoking entry areas are permitted, the facility manager shall make every effort to place those entries in areas around the structure to minimize the impact on non-smokers.

Stennis Procedural Requirements	SPR 8715.1	A
	<i>Number:</i>	<i>Rev.</i>
	Effective Date: July 25, 2006	
	Expiration Date: July 25, 2011	
Page 27 of 41		
Responsible Office: QA00/Office of Safety and Mission Assurance		
<b>SUBJECT: Safety and Health Procedural Requirements</b>		

## CHAPTER 5. HAZARDS SAFETY AND HEALTH

SSC Organizations shall abide by the SSC Hazards Safety and Health Program as defined below and in SSP-8715-0001, *SSC Safety and Health Handbook*.

### 5.1 Stennis Space Center Hazards Safety and Health Operating Procedures

Stennis Space Center shall develop hazards safety and health operating procedures pertaining to the areas listed below. Refer to SSP-8715-0001, *SSC Safety and Health Handbook* for specific information.

### 5.2 Confined Space Entry

- a. NASA/SSC and its contractors shall abide by Confined Space Entry safety procedures located in SSP-8715-0001, *SSC Safety and Health Handbook*, pertaining to entering and working in a confined space.
- b. Each SSC on-site resident agency and/or federal agency and/or their contractors located at SSC shall develop written Confined Space Entry procedures that comply with OSHA requirements, 29 CFR 1910.146, *Permit-required Confined Spaces*.

### 5.3 Hydrogen (H<sub>2</sub>) Entry

NASA/SSC and its contractors who have personnel who must perform tasks involving hydrogen entry (opening or breaking into the system), especially with respect to the preparation of lines (pipes and tubes), accumulators, vessels, etc. that have contained H<sub>2</sub> or are suspected to have contained H<sub>2</sub>, shall develop safety requirements, and procedures shall abide by their respective Hydrogen Entry safety requirements.

### 5.4 Oxygen and Combustible Gas Meter Operations

NASA/SSC and its contractors shall develop and adhere to procedures regarding the safety training and authorization required to operate oxygen, toxic atmosphere, and/or combustible/flammable gas meters.

### 5.5 Safe Handling of Triethylaluminum (TEAL) and Triethylborane (TEB)

NASA/SSC and its contractors shall develop and adhere to safety requirements that list the hazards involved, safety equipment required, safety precautions to follow, and procedures/process requirements when working around Triethylaluminum and/or Triethylborane.

Stennis Procedural Requirements	SPR 8715.1	A
	<i>Number:</i>	<i>Rev.</i>
	Effective Date: July 25, 2006	
	Expiration Date: July 25, 2011	
Responsible Office: QA00/Office of Safety and Mission Assurance		
<b>SUBJECT: Safety and Health Procedural Requirements</b>		
		Page 28 of 41

## 5.6 Liquid/Gaseous Oxygen Systems

a. NASA/SSC and its contractors shall abide by Oxygen Standard (ASTM Manual 36, *Manual for Safe Use of Oxygen and Oxygen Systems: Guidelines for Oxygen System Design, Materials Selection, Operation, Storage and Transportation*) for all safety issues regarding liquid and gaseous oxygen systems.

b. Requirements shall be included in all written procedures.

## 5.7 Gaseous and Liquid Hydrogen

a. NASA/SSC and its contractors shall abide *Guide to Safety of Hydrogen and Hydrogen Systems*, American Institute of Aeronautics and Astronautics, ANSI/AIAA G-095-2004 for all safety issues regarding liquid and gaseous hydrogen systems.

b. NASA/SSC and its contractors engaged in the design, construction and operation of hydrogen storage, transfer, conversion and pressurization facilities shall develop and abide by procedures respective to their operations.

c. Procedures shall provide a practical set of requirements and guidelines for the safe storage, handling and use of gaseous, liquid, or slush hydrogen.

## 5.8 Cryogenics

a. NASA/SSC and its contractors whose personnel are involved in the handling of cryogenics shall develop and adhere to procedures respective to their operations.

b. Procedures shall provide requirements for the safe handling of cryogenics and the safe operation of cryogenic systems at SSC. The procedures include top-level requirements for cryogenic safety, including liquid hydrogen (LH<sub>2</sub>), liquid oxygen (LOX), liquid nitrogen (LN<sub>2</sub>), and liquid helium (LHe), as well as emergency procedures and environmental concerns.

## 5.9 Pressure Systems

a. NASA/SSC and its contractors shall develop and comply with procedures respective to their operations.

b. The procedures shall outline the responsibilities and requirements for the design, inspection, testing, fabrication, installation, operation and maintenance of pressure vessels and systems.

Stennis Procedural Requirements	SPR 8715.1	A
	<i>Number:</i>	<i>Rev.</i>
	Effective Date: July 25, 2006	
	Expiration Date: July 25, 2011	
Responsible Office: QA00/Office of Safety and Mission Assurance		
<b>SUBJECT: Safety and Health Procedural Requirements</b>		
		Page 29 of 41

## 5.10 Explosives Safety

- a. NASA/SSC and its contractors involved in the shipping, handling, using and storing of explosives within the confines of SSC shall develop and follow explosives safety procedures.
- b. The procedures shall outline the responsibilities and requirements for shipping, handling, using and storing explosives.

## 5.11 Process Safety Management (PSM)

- a. All systems shall be evaluated for the need for Process Safety Management.
- b. All personnel who manage such systems required to have an active PSM program per the requirements of 29 CFR 1910.119 shall comply with the procedure for PSM specified in the SSP-8715-0001, *SSC Safety and Health Handbook*. This procedure provides guidance for compliance with Occupational Safety and Health Administration (OSHA), 29 CFR 1910.119, *Process Safety Management of Highly Hazardous Chemicals*.

## 5.12 Handling of Hydrocarbon Based Propellants

NASA/SSC and its contractors who work with RP-1 or any hydrocarbon fuel shall develop and abide by procedures for their respective operations. Procedures shall stipulate the associated hazards, necessary safety precautions and requirements to be observed when working with RP-1 or any Hydrocarbon Fuels.

## 5.13 Handling of Hydrogen Peroxide Propellants

- a. NASA/SSC and its contractors who have personnel working with and around Hydrogen Peroxide (H<sub>2</sub>O<sub>2</sub>) used as rocket propellant shall develop and comply with procedures respective to their operation.
- b. Procedure shall list the hazards involved, safety equipment required, safety precautions to be observed, and procedures/process requirements when working with and around Hydrogen Peroxide (H<sub>2</sub>O<sub>2</sub>) used as rocket propellant at concentrations higher than 52%.

**NOTE:** The requirements of this document apply to 50% H<sub>2</sub>O<sub>2</sub> when it is used as a conditioner to verify H<sub>2</sub>O<sub>2</sub> hardware system design.

## 5.14 Critical Lifting Operations

- a. All SSC Organizations utilizing NASA-owned and NASA Contractor-supplied equipment used in support of NASA operations shall comply with NASA standards and SSC procedures and requirements regarding critical lifting operations.

Stennis Procedural Requirements	SPR 8715.1	A
	<i>Number:</i>	<i>Rev.</i>
	Effective Date:	July 25, 2006
	Expiration Date:	July 25, 2011
Page 30 of 41		
Responsible Office: QA00/Office of Safety and Mission Assurance		
<b>SUBJECT: Safety and Health Procedural Requirements</b>		

b. Critical lifting operations requirements shall apply to overhead and gantry cranes (including top running monorail, underhung, and jib cranes), mobile cranes, derricks, hoists, winches, special hoist supported personnel lifting devices, hydra-sets, load measuring devices, hooks, slings and rigging, mobile aerial platforms, powered industrial trucks and jacks.

Refer to SWI 8834-0001, *SSC Lifting Devices and Equipment Management Plan*, for more information regarding lifting devices and equipment management.

Stennis Procedural Requirements	SPR 8715.1	A
	<i>Number:</i>	<i>Rev.</i>
	Effective Date: July 25, 2006	
	Expiration Date: July 25, 2011	
Page 31 of 41		
Responsible Office: QA00/Office of Safety and Mission Assurance		
<b>SUBJECT: Safety and Health Procedural Requirements</b>		

## CHAPTER 6. FIRE SAFETY AND HEALTH

SSC fire safety and health requirements pertain to the areas listed below. These fire safety and health requirements are applicable to all NASA and NASA Contractor personnel, as well as to resident agencies and their contractors performing work at SSC. More detailed information and procedures are provided in SSP-8715-0001, *SSC Safety and Health Handbook*.

### 6.1 Hot Work Permits

All NASA and NASA Contractor personnel, resident agencies and their contractors performing work at SSC shall comply with SPR 8715.3, *SSC Hot Work Permit Program*, if they engage in the following operations or activities:

- Electric Arc Welding.
- Oxy-Acetylene cutting/welding/heating operations.
- Operation of electrical, pneumatic or mechanical that is not intrinsically safe tools when operating in a Hazardous Classified area.
- Soldering torches powered by flammable gases.
- Open flame producing devices, or devices that produce hot sparks during operation.
- Burning of woodlands and brush piles.

### 6.2 Selection, Use, and Inspections of Fire Extinguishers

- a. Supervisors and/or building custodians shall assure that portable fire extinguishers are located and identified in their areas of responsibility.
- b. At the request of supervisors and/or building custodians at SSC, the Fire Department shall provide aid in determining the quantity, type, and location of portable fire extinguishers.
- c. The Fire Department shall inspect all fire extinguishers at SSC and develop, maintain and provide fire extinguisher training as requested by SSC onsite personnel.

### 6.3 Emergency Response/Employee Evacuation of Personnel in the Event of Fire

- a. All NASA/SSC personnel, NASA Contractor personnel, and SSC resident agencies (organization or an organization in association with its own contractors) located at SSC shall develop an Emergency Fire Evacuation Plan for its personnel.
- b. Each plan shall be forwarded to the SSC Fire Department. SSP-8715-0001, *SSC Safety and Health Handbook*, provides specific information to be included in Emergency Fire Evacuation Plans.

Stennis Procedural Requirements	SPR 8715.1	A
	<i>Number:</i>	<i>Rev.</i>
	Effective Date: July 25, 2006	
	Expiration Date: July 25, 2011	
Responsible Office: QA00/Office of Safety and Mission Assurance		
<b>SUBJECT: Safety and Health Procedural Requirements</b>		
		Page 32 of 41

- c. Upon suspecting or discovering a fire, employees shall immediately notify the SSC Fire Department by using the nearest fire alarm pull station.
- d. For fires located outside of a building or in remote areas, employees shall call the SSC Security Dispatcher (911 for SSC phones or 228-688-3636 for cellular phones on site that are routed through the Bay St. Louis phone system).
- e. Employees shall not enter/re-enter buildings after any fire alarm or notification until allowed by the Fire Department.
- f. The SSC Fire Department shall conduct, at a minimum, a yearly fire drill of all work areas/buildings at SSC, with fire department personnel stationed throughout the building/facility timing and observing the evacuation.

#### **6.4 Fire Symbols**

- a. The Supervisor in charge of the facilities or operations shall assure that the proper fire symbols/warning signs are provided and installed.
- b. Danger signs and labeling used shall conform to requirements specified by 29 CFR 1910.145, *Specifications for Accident Prevention Signs and Tags*.
- c. Fire symbols/DOT placards shall be placed on all transport vehicles immediately prior to loading and shall be removed from the vehicles immediately upon completion of unloading.

#### **6.5 Safety Requirements for Using/Storing/Dispensing Gasoline**

- a. Spills greater than 5 gallons shall be reported to the Spill Response Team and the cognizant safety officer by calling ext. 911.
- b. Spills less than 5 gallons shall be flushed with water.
- c. Configuration changes to gasoline storage containers and related systems shall be classified as SAFETY CRITICAL.
- d. Gasoline shall not be used as a cleaning solvent.
- e. Portable gasoline stoves shall not be used for heating purposes, unless specifically approved by the NASA/SSC Office of Safety and Mission Assurance.



Stennis Procedural Requirements	SPR 8715.1	A
	<i>Number:</i>	<i>Rev.</i>
	Effective Date:	July 25, 2006
	Expiration Date:	July 25, 2011
Page 33 of 41		
Responsible Office: QA00/Office of Safety and Mission Assurance		
<b>SUBJECT: Safety and Health Procedural Requirements</b>		

## 6.6 Natural Gas Systems

- a. No smoking or other possible ignition sources shall be allowed within 50 feet of gas piping, gas utilization equipment or accessories.
- b. All natural gas lines and related components shall be statically grounded.
- c. Natural gas systems shall include adequate relief valves.

Stennis Procedural Requirements	SPR 8715.1	A
	<i>Number:</i>	<i>Rev.</i>
	Effective Date: July 25, 2006	
	Expiration Date: July 25, 2011	
Page 34 of 41		
Responsible Office: QA00/Office of Safety and Mission Assurance		
<b>SUBJECT: Safety and Health Procedural Requirements</b>		

## CHAPTER 7. CONSTRUCTION SAFETY AND HEALTH

### 7.1 Stennis Space Center Construction Safety and Health Operating Procedures

a. Construction safety and health requirements shall apply to NASA and NASA Contractors as defined below and in SSP-8715-0001, *SSC Safety and Health Handbook*. These requirements are applicable to all off-site construction contractors performing work at Stennis Space Center under contract to NASA. Instructions provided herein and in SSP-8715.0001 provide construction and safety health operating procedures with respect to: excavations and excavation safety; pile driving; safety in concrete and masonry construction; diving/underwater work; building modifications within occupied facilities; and safety requirements related to roofing jobs at SSC.

b. All contractors shall present to the Contracting Officer (CO) or the Contracting Officer's Technical Representative (COTR) (or the respective office within the FOSC organization), a Construction Safety Program Plan prior to commencing work activities at SSC (refer to SSP-8715-0001, *SSC Safety and Health Handbook* for an example of this plan).

b. The plan shall detail the employer's safety and health program.

### 7.2 Excavations and Excavation Safety

a. A Dig Permit (SSC Form SSC-618) shall be required prior to any excavations at SSC.

b. All contractors working at SSC shall follow the procedures for excavation in accordance with SSC-STANDARD-99-015, *SSC Sitewide Digging Permit Standard*.

### 7.3 Pile Driving

All contractors working at SSC for NASA shall follow the OSHA safety requirements for pile driving operations that occur within the confines of Stennis Space Center.

### 7.4 Concrete and Masonry Construction

All SSC personnel involved in the building of concrete and masonry structures/facilities at SSC shall comply with OSHA safety requirements regarding design/analysis/authorization, working under loads, reinforcing steel, power concrete trowels, concrete saws, abrasive saws and other powered equipment, and cast-in-place concrete.

### 7.5 Diving/Underwater Work

Only qualified personnel shall perform diving/underwater work at SSC.

Stennis Procedural Requirements	SPR 8715.1	A
	<i>Number:</i>	<i>Rev.</i>
	Effective Date: July 25, 2006	
	Expiration Date: July 25, 2011	
Responsible Office: QA00/Office of Safety and Mission Assurance		
<b>SUBJECT: Safety and Health Procedural Requirements</b>		
		Page 35 of 41

## 7.6 Steel Erection

NASA and its Contractors shall follow OSHA requirements for the erection of steel structures at SSC, including fall protection; securing ladders; using a full body harness; open web steel joists; hauling tools and other hand-held equipment; removing trash; securing hoses, leads and cords; avoiding tripping hazards; posting signs when working overhead; and good housekeeping.

## 7.7 Safety of Motor Vehicles and Mechanized Equipment Used on SSC Construction Sites

- a. All NASA and its Contractors shall develop and follow requirements regarding the safety of motor vehicles and mechanized equipment used on SSC construction sites.
- b. Procedures shall specify requirements for removal of debris; unattended vehicles; inflating and mounting tires; working underneath heavy equipment; heavy equipment controls; parking brake use; and power lines.
- c. Use and movement of vehicles at SSC shall comply with vehicular requirements in SPR 1600.1, *SSC Security Requirements Handbook*.

## 7.8 Material Handling Equipment Requirement

All material handling equipment at SSC shall be equipped with a portable fire extinguisher of the proper type as defined by federal safety regulations NFPA 10, *Portable Fire Extinguishers*.

## 7.9 Site Clearing

All rider-operated equipment at SSC used in site clearing operations shall be equipped with rollover guards.

## 7.10 Rollover Protective Structures (ROPs)

NASA/SSC and its contractors shall use rollover protective structures for material handling and specific equipment as listed in the SSP-8715-0001, *SSC Safety and Health Handbook*.

## 7.11 Safety Requirements Related to Roofing Jobs at SSC

- a. Safety requirements for roofing operations shall comply with OSHA regulations and SSC fall protection requirements. Refer to 3.3, Fall Protection for more information.
- b. Although OSHA allows for personnel to watch over others referred to as a "Safety Monitoring System" for certain roofing activities, past history has shown this is not an effective fall protection methodology for roofing activities at SSC. Because of this, a means of fall

Stennis Procedural Requirements	SPR 8715.1	A
	<i>Number</i>	<i>Rev.</i>
	Effective Date: July 25, 2006	
	Expiration Date: July 25, 2011	
		Page 36 of 41
Responsible Office: QA00/Office of Safety and Mission Assurance		
<b>SUBJECT: Safety and Health Procedural Requirements</b>		

protection as outlined in OSHA and Section 3.3 of this document, Fall Protection in Industrial & Construction Activities, shall be used to provide worker protection when working off either high or low pitched roofs with a roof edge height greater than 6 feet from the ground level.

Stennis Procedural Requirements	SPR 8715.1	A
	<i>Number:</i>	<i>Rev.</i>
	Effective Date:	July 25, 2006
	Expiration Date:	July 25, 2011
Page 37 of 41		
Responsible Office: QA00/Office of Safety and Mission Assurance		
<b>SUBJECT: Safety and Health Procedural Requirements</b>		

## APPENDIX A – ACRONYMS AND ABBREVIATIONS

ACM	Asbestos-Containing Materials
AED	Automated External Defibrillator
ANSI	American National Standards Institute
ARB	Airworthiness Review Board
ASO	Aviation Safety Officer
ASTM	American Society for Testing and Materials
ATV	All Terrain Vehicles
CFR	Code of Federal Regulations
CHO	Chemical Hygiene Officer
CM	Configuration Management
dBA	Decibel level measured on the “A” scale
DOP	Detailed Operating Procedure
ESD	Electrostatic Discharge of Energy
FOSC	Facility Operations Support Services Contractor
FRI	Facility Risk Indicators
FRR	Flight Readiness Reviews
GSA	Government Services Agency
H <sub>2</sub>	hydrogen
H <sub>2</sub> O <sub>2</sub>	hydrogen peroxide
IRIS	Incident Reporting Information System
LH <sub>2</sub>	liquid hydrogen
LHe	liquid helium
LN <sub>2</sub>	liquid nitrogen
LOX	liquid oxygen
LSO	Laser Safety Officer
MSDs	Musculoskeletal Disorders
NFPA	National Fire Protection Association
OI	Operating Instruction
OPR	SSC Office of Primary Responsibility
ORA	Operational Readiness Assessment
OSHA	Occupational Safety and Health Administration
PPE	Personal Protective Equipment
PSM	Process Safety Management
ROPs	Rollover Protective Structures

Stennis Procedural Requirements	SPR 8715.1	A
	<i>Number:</i>	<i>Rev.</i>
	Effective Date:	July 25, 2006
	Expiration Date:	July 25, 2011
Page 38 of 41		
Responsible Office: QA00/Office of Safety and Mission Assurance		
<b>SUBJECT: Safety and Health Procedural Requirements</b>		

RP-1            Rocket Propellant  
 RPPA          Respiratory Protection Program Administrators  
 RSO            Radiation Safety Officer  
  
 S&MA          Safety and Mission Assurance  
 SAAI          Spray-Applied Asbestos Insulation  
 SCBA          Self-Contained Breathing Apparatus  
 SPR            SSC Procedural Requirement  
 SSC            Stennis Space Center  
 STARS        Striving to Achieve Real Safety  
  
 TEAL          Triethylaluminum  
 TPS            Test Preparation Sheet

Stennis Procedural Requirements	SPR 8715.1	A
	<i>Number:</i>	<i>Rev.</i>
	Effective Date: July 25, 2006	
	Expiration Date: July 25, 2011	
Page 39 of 41		
Responsible Office: QA00/Office of Safety and Mission Assurance		
<b>SUBJECT: Safety and Health Procedural Requirements</b>		

## APPENDIX B – DEFINITIONS

**“Critical” Lifts** – Refers to any lifting operation/device or equipment used to handle flight hardware or unique, one-of-a-kind NASA articles or major facility components whose loss would have serious programmatic impact. Critical lifts also includes the lifting of personnel with a crane or derrick; lifts of 75% of the capacity of a crane in its current configuration; and lifts utilizing multiple lifting devices. Additionally, for programmatic lifts at Stennis Space Center, the respective Program Manager will classify lifts involving program hardware as “Critical” or “Non-Critical”. Program lifting operations identified as “Non-Critical” may be reclassified as “Critical” by the SSC Lifting Devices and Equipment Manager or the NASA/SSC Safety and Mission Assurance Office if the lift involves hazards that are not program specific but reflect safety or facility concerns beyond normal lifting operations.

**Critical Person** – Any person who makes real-time decisions or performs real-time actions that could directly affect personnel safety and/or operational mission accomplishment.

**Danger Tag** – A tag used to provide an immediate alert of a hazardous or unsafe condition or process that might result in personnel injury or property damage in the event a component, system, or process is activated or utilized prior to corrective action being accomplished. See Section 2.5.2, Operational Requirements and Procedures, in the SSP-8715-0001, *SSC Safety and Health Handbook* for an illustration of a danger tag.

**Detailed Operating Procedure (DOP)** – The step-by-step procedure for performing tasks associated with research and development activities/experiments or propulsion test activities.

**Electric Shock** – Occurs when the human body becomes part of a path through which electrons flow either directly or indirectly.

**Entry Permit** – A NASA Confined Space Entry Permit (SSC Form 576), that allows a controlled entry into a confined space that contains, or has the potential to contain, hazards.

**Ergonomic Disorders** – Disorders which originally can manifest as strains and sprains, and can be an indication that the capacity of the body to accommodate stress has been exceeded. Acute muscle strains are disorders which occur when a concentrated episode has overstressed the musculoskeletal system. Chronic strains are disorders which result from less intense stresses that accumulate over a period of time, thus reducing the rate of recovery. (Also known as Musculo-Skeletal Disorders or MSDs.)

**Ergonomics** – The science of fitting the job to the worker.

**Hazard Analysis** – Identification and evaluation of existing and potential hazards and the recommended mitigation for the hazard sources found.

Stennis Procedural Requirements	SPR 8715.1	A
	<i>Number:</i>	<i>Rev.</i>
	Effective Date:	July 25, 2006
	Expiration Date:	July 25, 2011
Page 40 of 41		
Responsible Office: QA00/Office of Safety and Mission Assurance		
<b>SUBJECT: Safety and Health Procedural Requirements</b>		

**Hazardous Operation** – Operations involving materials or equipment that have a high potential to result in loss of life, serious injury to personnel, or damage to systems, equipment, or facilities (e.g., laboratory operations; high-pressure gas operations in excess of 150 psig; low-pressure high volume gas operations; voltages above 550 volts; storage and handling of liquid or solid propellants; storage and handling of explosives; use of “heavy lift” material handling equipment associated with critical lifts; extreme temperature environments, environments with less than 19.5 percent or more than 25 percent oxygen by volume at normal atmospheric temperature and pressure; confined space entries; lockout/tagout operations associated with pressure systems; electrical systems; or mechanical systems). A potentially dangerous process or series of acts involving hazardous materials or chemicals, technology, or systems with potential hazards to life, the environment or property.

**Hazardous Operational Certification** – A process that both documents and demonstrates the employee’s capability to safely perform unique skills and/or specialized work associated with hazardous operations.

**Hot Work Permit** – NASA/SSC written authorization (SSC Form 68) to perform operations that require flame producing equipment within a confined space. This form is only issued by the SSC Fire Department.

**Laboratory** – A laboratory is a facility where the use of hazardous chemicals occurs. It is a workplace where relatively small quantities of hazardous chemicals are used on a non-production basis.

**Lightning Protection System** – Lightning protection system refers to a complete system of air terminals, conductors, ground terminals, interconnecting conductors, arresters, and other connectors or fittings required to complete the system.

**Lockout/Tagout Requirements** – A process that involves placing a lock and tag on a piece of equipment to assure no one uses it. For example, in a situation where a piece of equipment is being repaired, a lockout/tagout is performed to prevent someone from operating that piece of equipment and to indicate who is handling the repair. Refer to section 3.9, Fundamental Safety Rules and Procedures Safety Requirements for Control of Hazardous Energy (Lockout/Tagout), of the SSP-8715-0001, *SSC Safety and Health Handbook* to review lockout/tagout requirements.

**“Non-Critical” Lifts** – All standard lifting operations that cannot be classified as “Critical”.

**Operating Procedure** – A detailed step-by-step procedure listing the functions, work tasks, safety precautions, tools and materials by which a person or team will perform a work or test activity. A good procedure assures that work is accomplished in a safe and efficient manner.



Stennis Procedural Requirements	SPR 8715.1	A
	<i>Number:</i>	<i>Rev.</i>
	Effective Date: July 25, 2006	
	Expiration Date: July 25, 2011	
Responsible Office: QA00/Office of Safety and Mission Assurance		
<b>SUBJECT: Safety and Health Procedural Requirements</b>		
		Page 41 of 41

**Process Skill Certification** – A process that both documents and demonstrates the specific training required to demonstrate proficiency in a skill associated with the quality of an end product or task.

**Radiation Safety Officer (RSO)** – One who has the knowledge and responsibility to apply appropriate radiation protection regulations. Contractors and resident agencies are required to have an RSO if they have licensable radiation sources or use licensable sources at their facilities or in their operations/activities located within the confines of SSC.

**Responsible Organization** – Those accountable for the specific duties that are performed to produce a desired result or effect. (NASA Directorates, Prime Contractors).

**SAFETY CRITICAL operations** – SAFETY CRITICAL includes any operation, process or procedure involving materials, equipment or tasks which have a high potential to result in loss of life, serious injury to personnel, and/or damage to systems, equipment or facilities. These include but are not limited to laboratory operations; high-pressure gas operations in excess of 150 psig; low-pressure high volume gas operations; voltages above 550 volts; storage and handling of liquid or solid propellants; storage and handling of explosives; use of “heavy lift” material handling equipment; extreme temperature environments; oxygen-deficient/enriched environments; confined space entries; lockout/tagout operations associated with pressure systems, electrical systems, or mechanical systems.

**SSC Radiation Safety Coordinator (RSC)** – The NASA manager of the radiation safety program for Stennis Space Center.

**Test Preparation Sheets (TPS)** – A procedural document used to authorize and describe test activation/operation and associated manufacturing tasks not covered by DOPs. TPSs are generally used by Test Operations personnel to document daily work activities of personnel associated with test programs.

**Unqualified Persons** – Those persons who are not properly trained in electrical operations and hazards.

**Voltage (High)** – Over 550 volts.